

ISS and Human Research Project Office Highlights May 14, 2010

ISS Research Program

CCF experiment ground support equipment commissioned at Portland State University

The ground-support equipment for the Capillary Channel Flow Experiment (CCF) was set up at Portland State University. The commissioning involved setup and operation of the ground-support unit and running simulations of various remote controlled operations in preparation for operation on ISS tentatively scheduled to start in July. A 5-member German team including PI, M. Dreyer (ZARM), was on site at Portland State University (PSU) during May 3-7, 2010 working to develop the CCF experiment commanding protocol, test matrix, and script writing capabilities. The CCF ground support hardware worked very well; a few minor software bugs were discovered and will be resolved in the next few weeks. Both manual mode and automatic operational simulation runs were performed. The Portland State members (Co-I: Mark Weislogel and PSU research associate: Yongkang Chen) and Bob Green received initial training on operation of the ground support hardware.

CCF is a fluid physics experiment to investigate capillary flow in a flat plate channel (Test Unit #1) and corner channel (Test Unit #2) under pressure-driven conditions in the inertia flow regime. The US Co-I is investigating corner flows, and ability of the corner flow geometry to passively separate two phase flow (gas bubbles). The experiment will utilize the ISS Microgravity Glovebox (MSG) facility on ISS. The US portion of this work is funded by the ISS Research Project. (POC: RET/Robert D. Green, 216 433-5402)



The German (ZARM) CCF team with PI: M. Dreyer describing details on the CCF flow schematic.

ACME RDR held on May 10-11.

The Advanced Combustion via Microgravity Experiments (ACME) Requirements Definition Review (RDR) was held for two days, May 10-11, 2010. The process continues as the Chair, Dave Frate, and the panel review documents with the engineering project team to ensure full understanding, compliance, and completion of success criteria. Dave gave a quick oral out-brief at the end of the review after the Science panel's out-brief. Generally, the presentations were very well received, and the PI's were impressed with the depth, experience, and understanding of the engineering. The engineering team now has a better grasp of the science requirements and the rationale behind the requirements. The HQ representative was pleased. The Science Requirements Document (SRD) was signed by all parties except for one PI who had to leave early before the signature page was prepared. (POC: MAH/J. Mark Hickman, (216) 977-7105)

SHERE II completes its Engineering System Acceptance Review

The Shear History Extensional Rheology Experiment II (SHERE II) flight experiment completed its Engineering Systems Acceptance Review-1 on May 12, 2010. This purpose of the review was to obtain engineering board assessment on the acceptability of the SHERE II hardware to proceed with shipment for flight STS-134 (ULF6 Middeck). The hardware scope of the review was the reflight of the Fluid Modules and Fluid Module Stowage Tray as the main hardware is already in orbit on ISS. The SHERE II team is awaiting a summary report from the engineering panel on their findings but overall the panel expressed that the review went very well with no major issues found.

SHERE was designed to study the effects of rotational preshearing on the stress/strain response of a polymeric liquid being stretch in a microgravity environment. SHERE II will expand that knowledge by studying a dilute polymer solution filled with PMMA particles. Filled polymeric suspensions form the bulk of the engineering plastic market and this study will provide a better understanding of the rheological properties of polymeric suspensions.

For more information about SHERE see:

<http://exploration.grc.nasa.gov/Exploration/Advanced/ISSResearch/SHERE/>

and for information about SHERE II, see:

http://spaceflightsystems.grc.nasa.gov/Advanced/ISSResearch/MSG/SHERE_II/

(POC: MAH/Nancy R. Hall, (216) 433-5643).

NASA GRC participated in Rockets for Schools in Sheboygan, WI

On May 7 and 8, 2020, Nancy R. Hall/MAH and Dawn Jenkins/QuinetQ participated at the 14th Annual Rockets for Schools Aerospace Expo and Rocket Launch that was held at the Blue Harbor Resort and Conference Center on the Lake Michigan shoreline in Sheboygan, WI.

(<http://www.rockets4schools.org/>) Rockets for Schools provides an opportunity for students to learn about aerospace technology, scientific experiments, and space launches. NASA GRC had an exhibit booth where the NASA materials were exhibited and passed out. Both Hall and Jenkins did numerous demos through the use of the demonstration drop tower and the water balloon video that highlights how water behaves in a reduced gravity environment. Another highlight of the event was a presentation by former NASA astronaut John Grunsfeld.

Approximately 4,000 people were expected, including over sixty teams of middle and high school students who launched (and recovered) their rocket. (POC: MAH/Nancy R. Hall, (216) 433-5643)



Nancy Hall and Dawn Jenkins



Dawn Jenkins giving demonstration.